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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,005	11/07/2001	Naoto Ikegawa	215900US0	4580

22850 7590 12/18/2002

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EXAMINER
KRUER, KEVIN R

ART UNIT	PAPER NUMBER
1773	4

DATE MAILED: 12/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/986,005	IKEGAWA ET AL.	
	Examiner	Art Unit	
	Kevin R Kruer	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "rubber-like" is indefinite. Specifically, there is no guidance given in the specification to one of ordinary skill in the art in how to determine when a substance is "rubber-like." Furthermore, claims 7 and 8 are indefinite because the term "plate-form" is indefinite. Specifically, it is not clear what makes a filler "plate-form" as opposed to "fibrous" or "spherical."

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al (US 4,772,496) in view of Applicant's Admissions. Maeda teaches a molded product having a printed circuit board on a thermoplastic layer. The board comprises a metal layer and a thin wall body containing a crosslinked product of a mixture of (a) 1-99wt% of an ethylenic copolymer containing at least one monomer unit

selected from the group consisting of monocarboxylic acid unit, dicarboxylic acid unit, acid anhydride unit thereof, and (b) 99-1wt% of an ethylenic copolymer containing at least one monomer unit selected from the group consisting of hydroxyl unit, amino unit, and oxirane unit (abstract). For example, the mixture may comprise (a) ethylene-ethyl acrylate-maleic anhydride terpolymer and (b) an ethylene-methyl methacrylate 2-hydroxyethyl methacrylate terpolymer (see Mixture III). Alternatively, the mixture may comprise (a) ethylene-methyl methacrylate-maleic anhydride terpolymer and (b) an ethylene-methyl methacrylate-glycidyl methacrylate terpolymer (see Mixture IV). The composition is molded and a metal layer may be vacuum deposited thereon (col 20, lines 48+).

Maeda does not teach that the composition should be plasma treated before application of the metal deposition layer. However, Applicant admits that the molded component of a printed wiring board is typically plasma treated before metal deposition. The plasma treatment is carried out in the activated gas atmosphere such as oxygen, nitrogen, and the like in the plasma act on the surface of the resin molded component to activate it by providing particles on the surface of the resin molded component with a polar group such as oxygen polar group, nitrogen polar group and the like, resulting in improved adhesion of the metal layer to the resin molded component (see "Description of Related Art"). Thus, it would have been obvious to one of ordinary skill in the art to plasma treat the resin composition taught in Maeda prior to metal deposition in order to improve the adhesion of the metal layer to the resin composition.

5. Claims 1, 3, 5, 6, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admissions in view of Okada et al (US 5,418,275). Applicant admits that printed circuit boards are typically manufactured by fabricating a resin molded component by injection molding a resin composition, and by coating the surface of the resin molded component with a metal layer serving as circuits by physical deposition method such as sputtering, vacuum evaporation, and ion plating. The molded component of a printed wiring board is typically plasma treated before metal deposition. The plasma treatment is carried out in the activated gas atmosphere such as oxygen, nitrogen, and the like in the plasma act on the surface of the resin molded component to activate it by providing particles on the surface of the resin molded component with a polar group such as oxygen polar group, nitrogen polar group and the like, resulting in improved adhesion of the metal layer to the resin molded component (see "Description of Related Art").

Applicant does not admit that the resin composition should comprise a base resin and a rubber-like elastic material. However, Okada teaches a polystyrene composition comprising (a) a syndiotactic polystyrene, (b) 1-100pbw of a high molecular compound comprising 5-95wt% of polyphenylene ether and 95-5wt% of a rubbery elastomer, and (c) 1-350pbw inorganic filler (abstract). The rubbery elastomer may comprise various rubbers such as SBS, SBR, SEPS, and natural rubber (col 6, lines 45+). Suitable fillers include fibers having a length of 50-50,000um and a diameter of 5-20um (col 7, lines 5+). Granular or powdery fillers may also be utilized (col 7, lines 10+). Said composition is greatly improved in impact resistance, and elongation (abstract) and is

favorably used for molding industrial materials such as printed circuit boards (col 8, lines 22+). It would have been obvious to utilize the composition taught in Okada as the molding composition of the printed wiring board admitted by applicant because Okada teaches the composition may be used for printed wiring boards and has the extra advantage of having improved impact resistance and elongation.

With respect to the claimed fibrous length of claims 6 and 8, the courts have held that a prima facie case of obviousness exist in the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art. see MPEP 2144.05.

6. Claims 1, 3, 5, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admissions in view of Furuta (US 5,206,281). Applicant admits that printed circuit boards are typically manufactured by fabricating a resin molded component by injection molding a resin composition, and by coating the surface of the resin molded component with a metal layer serving as circuits by physical deposition method such as sputtering, vacuum evaporation, and ion plating. The molded component of a printed wiring board is typically plasma treated before metal deposition. The plasma treatment is carried out in the activated gas atmosphere such as oxygen, nitrogen, and the like in the plasma act on the surface of the resin molded component to activate it by providing particles on the surface of the resin molded component with a polar group such as oxygen polar group, nitrogen polar group and the like, resulting in improved adhesion of the metal layer to the resin molded component (see "Description of Related Art").

Applicant does not admit that the resin composition should comprise a base resin and a rubber-like elastic material. However, Furuta teaches a composition comprising a polyphenylene ether, a modified propylene polymer, a rubbery substance, and an inorganic filler having an average particle diameter of 0.05-10um (abstract). The rubbery substance may comprise butadiene polymer, butyl rubber, SEPS, EPDM, and the like (col 14, lines 29+). The rubbery substance is included in amounts of 0-60pbw for 100pbw of the total amount of resin (col 17, lines 20+). The filler may be calcium carbonate, talc, clay, silica, barium sulfate, titanium oxide, alumina and gypsum (col 17, lines 27+) and is included in amounts of 1-60pbw of resin. The composition has improved processability, has well balanced physical properties (abstract) and is useful for printed circuit boards (col 22, line 13). It would have been useful to utilize the composition taught in Furuta as the molding composition of the printed wiring board admitted by Applicant because Furuta teaches such compositions are useful for printed wiring boards and said composition has improved processability and has well-balanced physical properties.

7. Claims 1, 3, 5, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admissions in view of Burnell et al (US 6,165,309). Applicant admits that printed circuit boards are typically manufactured by fabricating a resin molded component by injection molding a resin composition, and by coating the surface of the resin molded component with a metal layer serving as circuits by physical deposition method such as sputtering, vacuum evaporation, and ion plating. The molded component of a printed wiring board is typically plasma treated before metal

deposition. The plasma treatment is carried out in the activated gas atmosphere such as oxygen, nitrogen, and the like in the plasma act on the surface of the resin molded component to activate it by providing particles on the surface of the resin molded component with a polar group such as oxygen polar group, nitrogen polar group and the like, resulting in improved adhesion of the metal layer to the resin molded component (see "Description of Related Art").

Applicant does not admit that the resin composition should comprise a base resin and a rubber-like elastic material. However, Burnell teaches a substrate material useful as a substrate for a conductive laminate (abstract). The substrate comprises polyphenylene ether resin and a copolymer of a vinyl aromatic compound and an unsaturated cyclic anhydride. The copolymer of a vinyl aromatic compound and the unsaturated cyclic anhydride is preferably a polystyrene maleic anhydride copolymer or rubber modified polystyrene maleic anhydride copolymer (abstract). The copolymer is effective to improve adhesive strength between the conductive laminate and the substrate material (col 3, lines 46+). The copolymer is included in amounts of 1-15wt% (col 6, lines 20+). The composition may also comprise fibrous filler. These minerals typically have a particle size under 40um (col 7, lines 3+) and are included in the composition in amounts of 2-50wt% (col 7, lines 13+). It would have been obvious to utilize the composition taught in Burnell as the molded component admitted by applicant because said composition has improved adhesion to the conductive layer.

8. Claims 1, 3, 4, 5, and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admissions in view of Kubota et al. (US 4,395,512).

Applicant admits that printed circuit boards are typically manufactured by fabricating a resin molded component by injection molding a resin composition, and by coating the surface of the resin molded component with a metal layer serving as circuits by physical deposition method such as sputtering, vacuum evaporation, and ion plating. The molded component of a printed wiring board is typically plasma treated before metal deposition. The plasma treatment is carried out in the activated gas atmosphere such as oxygen, nitrogen, and the like in the plasma act on the surface of the resin molded component to activate it by providing particles on the surface of the resin molded component with a polar group such as oxygen polar group, nitrogen polar group and the like, resulting in improved adhesion of the metal layer to the resin molded component (see "Description of Related Art").

Applicant does not admit that the resin composition should comprise a base resin and a rubber-like elastic material. However, Kubota teaches a composition comprising 100pbw polyphenylenesulfide resin, 10-300 pbw of an inorganic filler and 1-00pbw of a fluorine-containing rubber (abstract). The composition has improved impact resistance, crack resistance, and heat shock resistance (abstract) and may be utilized in printed wiring boards (col 2, lines 4+). Therefore, it would have been obvious to one of ordinary skill in the art to utilize the composition taught in Kubota in the printed circuit board admitted by Applicant because said composition is taught to be useful for printed wiring boards and has improved heat shock resistance, crack resistance, and heat shock resistance.

9. Claims 1-3, 5, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admissions in view of Furuta et al (US 6,124,004). Applicant admits that printed circuit boards are typically manufactured by fabricating a resin molded component by injection molding a resin composition, and by coating the surface of the resin molded component with a metal layer serving as circuits by physical deposition method such as sputtering, vacuum evaporation, and ion plating. The molded component of a printed wiring board is typically plasma treated before metal deposition. The plasma treatment is carried out in the activated gas atmosphere such as oxygen, nitrogen, and the like in the plasma act on the surface of the resin molded component to activate it by providing particles on the surface of the resin molded component with a polar group such as oxygen polar group, nitrogen polar group and the like, resulting in improved adhesion of the metal layer to the resin molded component (see "Description of Related Art").

Applicant does not admit that the resin composition should comprise a base resin and a rubber-like elastic material. However, Furuta teaches a laminate comprising a metallic foil and a layer made of liquid crystal polyester resin composition comprising (a) a liquid crystal polyester, and (b) a rubber having a functional group reactive with the liquid crystal polyester dispersed phase (abstract). The rubber is included in amounts of 2-30wt% (col 9, lines 58+) and preferably comprises an ethylene-methacrylate-unsaturated carboxylic acid glycidyl ester (col 9, lines 1+). A filler may also be included in the composition (col 10, lines 23+). The composition has excellent heat resistance, low relative dielectric constant, and excellent appearance (abstract). Thus, it would

have been obvious to one of ordinary skill in the art to utilize the composition taught in Furuta in the laminate admitted by Applicant because such compositions have excellent heat resistance, low relative dielectric constant, and excellent appearance.

10. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admissions in view of Furuta et al (US 6,124,004), as applied to claims 1-3, 5, and 11 above, and further in view of Inoue et al (US 4,943,606). Applicant's admissions in view of Furuta is relied upon as above, but does not specify the filler utilized in the polyester composition. However, Inoue teaches a polyester composition useful for making printed wiring boards (abstract) that comprises 10-70wt% filler. Inoue teaches that the filler utilized should be an inorganic fibrous or acicular material having an average diameter of 15um or less and an average length of 200um or below (abstract). The fillers can be utilized alone or as admixtures of two or more (col 6, lines 45-46). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a blend of fibrous and acicular (herein taken to read on "plate-form") particles in amounts of 10-70wt% because Inoue teaches that such blends can be utilized in polyester composition in the printed wiring board art to give the desired processability and plating adhesion strength (col 7, lines 41+).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin R Kruer whose telephone number is 703-305-0025. The examiner can normally be reached on Monday-Friday from 7:00a.m. to 4:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau, can be reached on (703) 308-2367. The fax phone number for the organization where this application or proceeding is assigned is 703-305-5408.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

K-R K-

KRK

Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700